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E-WEEK: SPEAKER - BEHIND THE SCENES - RESPONSES



RECYCLE THIS ISSUE

+engineers &
the environment



Letter from the Editor

Dear Readers,

The theme for E-Week 2008 was “Sustaining the Environment.” Additionally, the environment was the focus of the inaugural 2007-2008 Nebraska Colloquium, which helped raise environmental awareness across campus.

The staff of the Nebraska Blueprint decided to follow suit, so our theme this issue is centered on the environment.

Engineer Rachel Thorpe contributed several suggestions people can follow to lead a more environmentally-friendly lifestyle, which you can read on page 4.

In addition to these tips, please recycle this edition of the Nebraska Blueprint by passing it on to others and by taking advantage of the various recycling bins around campus.

Finally, congratulations on another successful year at the College of Engineering.



Natasha Richardson
Editor In Chief
News-Editorial



BRIAN WATT
Biological Systems Engineering
Cover Editor



ASHLEY JOHNSON
Biological Systems Engineering
Reporter



BRIAN NEILSON
Mechanical Engineering
Reporter

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COVER: MATT BUXTON, BRIAN WATT

CONTENTS PHOTO: MATT BUXTON

STAFF PHOTOS: BRIAN WATT

NOT PICTURED:

HANNAH PETERSON
Advertising
Layout, Reporter

JS ENGBRETSON
Adviser



MATT BUXTON
News-Editorial
Photographer, Layout



KHOA CHU
Mechanical Engineering
Reporter

ENGINEERS^{AND THE} ENVIRONMENT

ENVIRONMENTALISM TIPS

COURTESY RACHEL THORPE



PHOTO: NATASHA RICHARDSON

- + Turn off the water when brushing your teeth
- + Turn off the lights when you exit a room
- + Use a smaller amount of detergent - it doesn't take as much soap as you think
- + Don't drive over the speed limit - this increases fuel efficiency
- + Caulk a window to prevent air leaks
- + Turn off the water while soaping up your hands
- + Cut your shower time by five minutes
- + Re-use a plastic bag
- + Don't take a bag at the store if you're only buying one or two small things
- + Check your tires - proper air pressure increases your fuel efficiency and lengthens the life of your tires
- + Buy a reusable water bottle to refill instead of buying plastic bottled water
- + Read a book instead of watching TV
- + Recycle!
- + Turn off your oven five minutes before the timer is up - the oven will stay hot enough to finish cooking your food
- + Use reusable containers for food storage instead of wrapping food in foil or plastic wrap
- + Use vinegar and water as a replacement for glass cleaner
- + Air dry dishes instead of using your dishwasher's drying cycle

Read a full article about the work Rachel Thorpe has done to make her factory more environmentally friendly on page 8.

Advances in technology over the past few years have been staggering. Social networking and photo Web sites have exploded. Digital cameras and camera phones are now the standard. And everyone wants to go wireless. Naturally, we would like to transfer photos from our cameras to photo Web sites without wires. Sound like a dream world? Not anymore.

SD cards used in your camera now may someday look to be replaced by the Eye-Fi, an SD card for digital cameras with wireless capabilities.

The Eye-Fi card is simple to use. The card is first inserted into a USB reader, which in turn is plugged into a computer. Next, software is set up to receive photos directly on your computer, to upload them to a variety of photo Web sites or both. After the software is set up, the card is put in the camera and is ready to hold photos.

When one is ready to upload photos, the Eye-Fi card can connect to a pre-configured Wi-Fi network. Eye-Fi uses the IEEE 802.11g specification. The card can even log into your favorite photo Web sites in order to upload the pictures.

For \$100, the Eye-Fi card gives you 2 GB of memory.

Though the technology is not yet perfect, there are several benefits. No limits are imposed on the image size. The software is easy to set up. The Wi-Fi access is secure and private.

A few disadvantages have yet to be worked out. The



COURTESY PHOTO

transfer speed is rather slow. The company says the range is 45+ feet indoors and 90+ feet outdoors, although problems have been reported at distances less than these.

Photos can only be uploaded to a pre-configured wireless network, not at your local Wi-Fi coffee house.

Also, all photos on the card are uploaded at once, without a chance to pick and choose.

Finally, the pictures are uploaded at full resolution. However, if the destination is a Web site that requires a certain size of photo, the Eye-Fi card will take care of it.

Eye-Fi is available at several online vendors and four stores in other parts of the country.

Although a few cameras have ventured onto the market with built-in Wi-Fi capabilities, none of them offer the flexibility and universality the Eye-Fi offers.

Eye-Fi SD cards are available for purchase online. To find out more about the Eye-Fi SD card, visit the company's Web site at www.eye-fi.com.

ENGINEERS^{AND THE} ENVIRONMENT

LT. COL. JEFF GILLEN

BY ASHLEY JOHNSON

Typically, an engineer is not thought of as being in the middle of the action. This is not true for Lt. Col. Jeff Gillen, however.

Throughout his career, Gillen has had many opportunities as an engineer in the Air Force. He worked on the Joint Staff in the Pentagon during the 9/11 attacks. After the attack on the Pentagon, Gillen re-entered the burning building and assisted coordinating the movement of the Navy's hospital ship from Baltimore and Air Force medical units online near New York City.

"When things are going crazy, you can always find Lt. Col. Gillen right in the middle of the chaos," said Air Force Lt. Col. Kirk A. Phillips. "He is usually the one that thinks outside of the box, uses a novel concept and gets everything back on track."

In 2001, Gillen authored the policy memo for deployment health standards. Deployment health is a field that helps keep soldiers healthy while serving overseas in deployed environments.

Ever since he was in high school, Gillen knew two things: he wanted to be an Air Force officer and a civil engineer. A native of Vermillion, S.D., Gillen first started wearing the Air Force uniform right out of high school as an engineering apprentice with the South Dakota Air National Guard, Sioux Falls, S.D.

Shortly after returning from basic training and technical school, where he learned the fundamentals of drafting and

land surveying, Gillen began his academic career as a civil engineering student at South Dakota State University. After his first semester, he received an Air Force ROTC 4-year technical scholarship, graduating in 1987 with his Bachelor of Science degree in civil engineering.

During the summer, Gillen worked for the South Dakota Department of Transportation, supervising road construction.

In January 1988, Gillen was commissioned as a second lieutenant in the biomedical science corps as a bioenvironmental engineer. Bioenvironmental engineering is a cross-functional career field of three jobs in one: industrial hygiene, environmental engineering and health physics. Bioenvironmental engineers are responsible for assessing hazardous situations in the workplace, minimizing the pollution from the Air Force base and monitoring the air, soil and water for toxic industrial compounds or threats such as weapons of mass destruction.

Today, terrorists may seek atypical methods such as biological, chemical or radioactive compounds to use as weapons against the United States. As an Air Force engineer, Gillen monitors the environment and ensures occupational and environmental exposures are within occupational and environmental exposure limits.

Additionally, he ensures the base does not violate Environmental Protection Agency laws and workers are

protected from unnecessary exposures to hazards in their workplace.

"It is all fused together to ensure the health of the environment and the health of people," he said.

After serving five years in Las Vegas, Gillen was selected to return to SDSU in 1993 to earn a master's degree in environmental engineering.

Currently, Lt. Col. Gillen is the chief of Homeland Medical Plans Division, office of the Air Force Surgeon General. He is responsible for planning efforts to enable medical response to any hazard, man-made or natural. Gillen's division assists Air Force bases worldwide getting ready for events such as pandemic flu; use of chemical, biological, radioactive or nuclear weapons; or any host of natural disasters.

Other engineering opportunities in the Air Force include research and development, acquisitions, aerospace and space operations and base civil engineering. In the Air Force, a base civil engineer is much like a city engineer, responsible for the infrastructure of the city and managing the buildings, drinking water and sanitary sewer systems, the electrical power distribution network, the streets and the base's runways.

"An Air Force base is a city similar to any city in the U.S. but with an important difference," he said. "It is protecting and defending America's air, space and cyberspace military capabilities."



COURTESY PHOTO

Engineers in the United States Air Force work on a variety of projects. They work on research and development, designing future weapons systems such as the F-22 Raptor – the Air Force’s next generation stealth fighter – or the Global Hawk and Predator unmanned aerial vehicles, the ultimate application of remotely controlled airplanes.

Gillen stated that every day of the past 20 years has been exciting, and it “seems like yesterday” when he first arrived at Nellis AFB in Las Vegas.

“We (Gillen and other bioenvironmental engineers) monitor air, water, soil and workplaces,” he said. “Our surveillance efforts minimize and document any exposure Air Force members may experience

in their work area or from a deployment location. We’re trying to prevent any exposure that could cause them to get sick.”

Although Gillen was involved in ROTC straight out of high school, this is not necessary to become an engineer in the Air Force.

Engineers can join the Air Force after they get a degree through recruitment processes. Engineers can serve as commissioned officers. Also, college students interested in engineering could attend the Air Force Academy. Approximately 80 percent of the academy is devoted to engineering.

As an engineer in the Air Force, Gillen has gained responsibility and leadership

and served his country. In his 20 years as an Air Force engineer, Gillen has been stationed at seven different bases and deployed once to Southwest Asia. The projects Gillen has worked on have served not only the Air Force, but also the United States and our allies.

“Here’s the takeaway,” he said. “Being an engineer serves your community. What I really like about engineering is the application of science to serve the community. Being an Air Force engineer also serves to protect our country.”

ENGINEERS^{AND THE} ENVIRONMENT

RACHEL THORPE

PHOTOS AND STORY BY NATASHA RICHARDSON

While engineer Rachel Thorpe was a student at the University of Nebraska at Omaha from 1999-2003, she took an environmental class that made her realize what she wanted to do for the rest of her life.

“A light just totally went on,” she said.

Thorpe, who lives in Omaha, said many people complain about the chlorine taste of the city’s water, but they could be experiencing much worse water quality. Her instructor for the environmental class put this into perspective by explaining how women in South America were washing their clothes downstream from slaughterhouses.

That’s when she decided she wanted to make a difference, she said.

Stacey Hawkey, who worked with Thorpe during an undergraduate internship, said she thinks Thorpe is a great representative of engineering. “Rachel is a great example of what I trust is the new generation of engineers being educated at the university,” Hawkey said. “Positive, pleasant and technically sound.”

Now Thorpe, 27, is working to make things better for the environment every day at her job. She works for Square D-Schneider Electric in Lincoln as a waste-water treatment engineer, an electroplating engineer and a safety, health and environmental engineer. Some of her responsibilities include covering monthly



safety topics, helping with weight-loss programs, leading emergency drills that cover what the staff would do in the case that someone was injured and keeping environmental programs going.

And those environmental programs are what Thorpe is especially interested in.

“I really like anything that has to do with helping our environment and keeping that whole sustainable way of life,” Thorpe said.

She explained that there is a delicate balance people must maintain to protect the earth.

“We take care of the earth, the earth takes care of us,” she said.

Thorpe described how environmentalism is important not only in the work place, but as a way of life.

“You’re not necessarily saying, ‘This is what we’re going to do on your clock from 6:30 to 2,’” she said. “We want you to take it home. And so we try to incorporate things that happen outside of work. You know, ‘How do you save energy at home? How does planting a tree help you? How does planting a tree help your house? What are little tips that you can use when you go to buy a refrigerator?’ Those types of things that have nothing to do with work, but have to do with their lives outside of work.”

Thorpe said she thinks that incorporating environmental tips that employees can use at home into the environmental programs at Square D-Schneider Electric can help make a difference in how people view environmentalism.



"I think it helps people to see environmentalism as more of a way of life rather than something you have to do to keep your job," she said.

As an engineer, Thorpe has tackled environmental issues but hasn't faced challenges as a woman in a male-dominated field. Though Thorpe was a minority as a woman in her classes, she said that sexism has never been an issue she has had to face. Thorpe estimated that her classes at UNO usually consisted of only 8-9 percent of women.

"It's kind of funny because I imagined that it would have been tough as a woman. Or thinking that people are going to be saying, 'Oh, a woman can't do that' or 'You're in a man's world' or all those type of things, and it hasn't. I don't know if that would hold back other women by thinking that maybe they'll be looked down upon or have some kind of harassment against them. And I haven't experienced anything," she said.

Thorpe said that pink industrial boots are even available for purchase to accommodate women in her field.

She summed up her feelings about sexism in a word: perspective. Thorpe said a person's attitude can make all the difference.

"I think that a lot of times people can decide one way or the other how society is oppressing them," she said. "So you can take one situation and twist it however you want to."

People in the industry field are more focused on who can get the job done, she said. "You have a certain expectation that you want filled, and especially if you're in industry, it is such a tough, competitive market, and you can't waste time hiring someone just because they're a woman," Thorpe said.

She admitted, however, that just because she hadn't experienced sexism doesn't mean that it is nonexistent. "There are going to be people out there that still enjoy the good ol' boy club," Thorpe said. "We don't live in a perfect world, that stuff happens, but when you get in a professional situation, they really look at you as your resume."

In her experience, employers chose who they were hiring based on whether a potential employee could do a job or not, she said.

"I'm very much a believer of equality."

E-WEEK2008

JEFF ZVOLANEK

BY BRIAN NEILSON



PHOTO: MATT BUXTON

"It's not just about you anymore. It's a global situation." This was one message brought to future and present engineering students by E-Week keynote speaker Jeff Zvolanek. Zvolanek, co-founder and president of Industrial Maid, LLC, in Cortland, Neb., spoke about "Not the American Dream, but American Reality."

Zvolanek grew up in Wymore, Neb., south of Beatrice. He first attended E-Week as a high schooler. He was fascinated enough with engineering that he came to the University of Nebraska-Lincoln to study industrial and management systems engineering. In fact, the top three students in his high school class went into engineering.

Zvolanek got his bachelor's degree in 1986 from UNL, and he now lives in Lincoln.

During his E-Week presentation, Zvolanek showed souvenirs from his time in college. He held up some FORTRAN punch cards from his computer programming class. Some of the older members of the crowd smiled as they remembered the old computer technology. Zvolanek said there were no computer labs at UNL until he was a junior.

Although it was nearly obsolete when he was in college, he showed a slide rule, used for calculations. "Instead, we used this TI-55 calculator," he said, holding one up. After showing how much engineering has changed in the past 20 years,

Zvolanek said that change will happen even faster in the next 20 years.

After graduating from college with carbon steels, among other materials. While working in the shop, he began to notice the air filtration system and said, "That has to be a good business."

Sure enough, Zvolanek opened an air filtration business in 1989 that was open through 1997 before being bought by Linweld. Zvolanek worked there for four more years before starting on his master's degree in environmental engineering.

In 2004, he helped start the air filtration and ventilation company Industrial Maid, LLC. Their business covers all of North America, and a company in Miami helps them do international



PHOTO: MATT BUXTON

business. "It's becoming global quick," Zvolanek said.

"Engineering is a great platform for whatever you want to do," Zvolanek said. "It's not just about being an ME or an IE, but that you have skills people in other majors don't get."

Zvolanek talked about three of his engineering friends in particular. One, an electrical engineer who graduated with a 4.0, decided he didn't want to do engineering after graduation. He went to medical school instead and is now an orthopaedic surgeon.

Another friend, who was a mechanical engineer, went to law school after graduation. He

is now a lawyer in Dallas.

A third friend came to UNL on an ROTC scholarship. After serving in Colorado for a while, he went back to school and got his master's degree in mechanical engineering. He now works at Lawrence Livermore National Laboratory and has designed a new scuba-diving apparatus.

Zvolanek's company, Industrial Maid, LLC, assembles and sells air filtration and ventilation products out of their headquarters in Cortland. A unique feature of this company is that the cabinets for their units are made from recycled high density polyethylene plastic. The benefit to customers is that the

units are lighter, less expensive and non-corrosive. Also, the cabinets will not dent or scratch, and the noise is dampened. The benefit to the environment is that a standard T-series cabinet uses the plastic of 50 recycled milk jugs.

Industrial Maid, LLC, helps companies control welding smoke, plasma cutting smoke, laser cutting fumes and wood dust. Companies have saved from \$1,000 to \$1 million per month as a result.

Zvolanek said environmental conditions have been forced to get better by new regulations. Companies are restricted on outside exhaust.

"Companies save money by not having to bring in heated/cooled makeup air," he said. He also stressed that process containment is the key. By not letting particulates spread out too far in the air, energy is saved drawing them back into the filter.

Zvolanek also said the most serious issue facing air quality was that "people are not aware of some of the simple solutions for actually complex problems."

Zvolanek highly encourages students to take advantage of the resources available with the faculty and staff. He then summed up his message: "If you don't know something, there's somebody that does."

E-WEEK2008

BEHIND THE SCENES

BY KHOA CHU

EDITOR'S NOTE: Khoa Chu is on the Nebraska Blueprint staff and is also a member of the Engineering Student Advisory Board. This is his behind-the-scenes look at E-Week.

Engineering Week, or E-Week, has been a tradition at the University of Nebraska-Lincoln since 1913. During E-Week, current students can participate in different activities like the quiz bowl, scavenger hunt, pitch tournaments, open house and many other activities. These events are a way of rewarding the students for their hard work after completing the long academic year. But with all the fun and excitement, we sometimes forget those who have contributed and helped put together these events.

The E-Week committee, comprised of several members from the Engineering Student Advisory Board, students from other organizations and volunteers, made this year's E-Week successful for both students and faculty members.

But before E-Week, there was a lot of planning in the fall of the academic year.

PLANNING PERIOD

The planning involved picking out a theme for E-Week. This year

was special in that the theme was chosen as environmentalism by the College of Engineering.

After the theme was picked, the E-Week committee began to brainstorm about a possible logo for E-Week and ideas for events during the week. This process took about three to four months.

THE DOWNTIME

There were also a few periods of waiting. During these periods, different tasks were assigned to committee members, including calling different organizations to find donors for prizes. In addition, the food for lunch had to be set and finalized for E-Week. That involved calling the local pizzeria Da Vinci's and asking them to help with lunch and keeping in contact with the business to make the process smoother.

FINAL STAGES

After winter break, the committee started to meet every week instead of every other week to finalize E-Week and complete tasks that weren't yet finished.

The first thing that the committee did after coming back from break was to finalize the logo design for E-Week and assign each committee member an event to be in charge of during E-Week. Then the committee chose the location for each event and figured out what day and time the events would occur.

During March, those who were in charge of the different events had to come up with a list of activities to do for their event. This planning ranged from coming up with questions for the quiz bowl to booking an area for the Engineering Elympic.

After completing these tasks, the schedule for E-Week was finalized. By early April, the designs for fliers for each of the events were copied and posted throughout the college.

Then registration for the events began after the fliers were posted. Registrations were open for two weeks, and then E-Week kicked off on April 20.



On E-Week's events:

"It's cool to be able to see people from class outside of class."

Cassie Teeter
Sophomore
Mechanical Engineering



On the open house:

"I'm enjoying explaining what we do to all the kids. They seem to enjoy it."

Mike Florek
Sophomore
Civil Engineering



On the senior projects:

"It's great to see that they're working on the leading edge of technology."

David Lederer
E-Week Judge, Alumnus and
Dean's Advisory Board member

E-WEEK2008

COMPETITION RESULTS

SENIOR PROJECTS

+AGRICULTURAL ENGINEERING

1ST PLACE: Design of the 2008 Quarter Scale Tractor
Will Corman, Roger Hoy, Grant Janousek, Mark Tieszen

+BIOLOGICAL SYSTEMS ENGINEERING

1ST PLACE: Regaining Surface ECG Signal During Defibrillation Testing
Megan Krause, Rob Corn, Issar Yazhbon

2ND PLACE: Zien Extraction from DDGS
Laura Podany, Peter Larson, Isaac Mortensen, Ben Carlson

3RD PLACE: Hydrogel Patch with Physical Guidance for Cardiomyocyte Growth
Andrea Tuma, Erica Levorson, Dipika Singh

+CHEMICAL ENGINEERING

1ST PLACE: Process Manufacturing of Hydrogen Peroxide
Cassie McBride, Anita Bowman, Patty Johnson, Carissa Gengenbach

2ND PLACE: Enzymatic Production of Formaldehyde and Hydrogen Peroxide from Methanol
Wes Navrkal, Tisha Roth, MinJeong Schneider, Chieu Nguyen

3RD PLACE: Cumene Production
Ashley Tyree, Maja Niksic, Wei Loh, Sara Conrad

+CIVIL ENGINEERING

1ST PLACE: SDP Consulting
John Smith, Jake Deaver, Quinton Patzlaff, Matt Richart, Luke Summers, Joe Troester, Jake Vasa

2ND PLACE: Adams Street Re-Design by Schurr Solutions, LLC
Nick Stremlau, Josh Bauer, Cale Farquhar, Brandon Smid, Jennifer Schmidt, Ashley Stutzman, Matt Clark

3RD PLACE: 84th and Adams Design
John Parizek, Kevin Dopp, Michael Kohn, Seth Reddy, Aaron Loeck, Matt Nienaber

+COMPUTER AND ELECTRONICS

1ST PLACE: Pressure Sensing Signature Pad
David Smith, Matthew Birrell

2ND PLACE: Robotic Snowblower
Ed Dale, Mark Huebner, Donell Brown

3RD PLACE: Remote Technician Emulator
Jennifer Stephens, Kyle Hovorka, Drew Rash

+COMPUTER SCIENCE

1ST PLACE: Dancing Robots!
Adam Eck, Daniel Podany, Bradly Paul

2ND PLACE: Life 'N Touch
Jeremy Muehlbauer, Kyle Dobitz

3RD PLACE: dorMouse
Erick Lang, BinhAn Ta, David Kim

SENIOR PROJECTS

+ELECTRICAL ENGINEERING

1ST PLACE: Bikers Assistant
Ben Grummert, Dustin Colwell, Jeff Casey,
Chris Ruiz

2ND PLACE: Mercury Trainer
Brian Irish, Keith Derr, Seth Springer, Jeff
Hoover, Nick Rowse

3RD PLACE: The Car Follower
Abhinav Pandey, Masoud Majhour
Samani, Tanner Sterling, Nikesh Regmi,
Stephen Hoffman

+INDUSTRIAL ENGINEERING

1ST PLACE: Patient Flow at Bryan LGH
West
Justine Smith, Brad Hilker, At-Suo
Nakagawa

2ND PLACE: Improving Hospital ED Patient
Flow
Justin Rousek, Cole Heavican

3RD PLACE: Duncan Aviation Finishing
Shop Facility Planning
Sarah Walz, Kevin Loh, Brad Marshall

+MECHANICAL ENGINEERING

1ST PLACE: Front Suspension for a Mini
Sandrail
Amber Ingmire, Brian Husted, Aaron
Mulock

2ND PLACE: Field Goal Kicker
Brent Griffin, Scott Sharp

3RD PLACE: EZ-Cast
Chris Kohler, Sam Cumper, John Cejka

COMPETITIONS

+SCAVENGER HUNT

1ST PLACE: Sarah Schroeder, Cassie
McBride & Greg Arthur

2ND PLACE: Ashley Guinan & Katie Miller

+ELYPICS

1ST PLACE: (towers) and overall champion:
Deanna Mlnarik

1ST PLACE: (rockets): James Henderson

+PITCH TOURNAMENT

1ST PLACE: I'm not your friend, Buddy!

2ND PLACE: Team Car Ramrod

3RD PLACE: Team Kirkland

+DODGE BALL

1ST PLACE: We Love Parks

2ND PLACE: Head-Hunters

3RD PLACE: The Team to Beat

+HALO TOURNAMENT

1ST PLACE: Luke Doane

2ND PLACE: Matthew Mahlin

+QUIZ BOWL

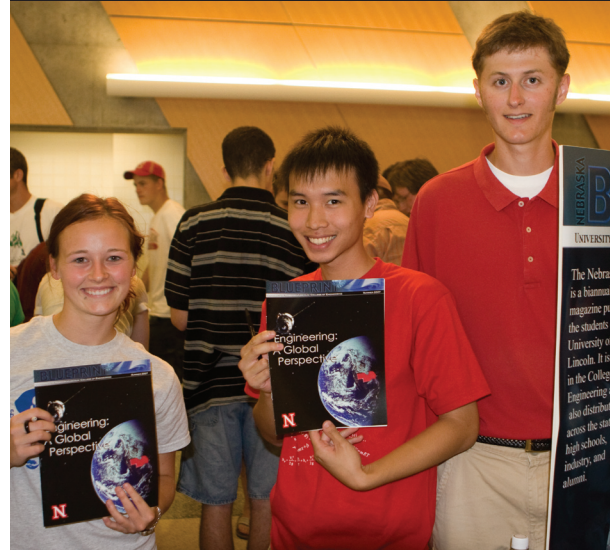
1ST PLACE: Ice 9

2ND PLACE: Annexation of Puerto Rico

INSIDE THIS ISSUE



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staff, contact us at:

nrichar5@bigred.unl.edu

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